7

AN ESSAY TOWARD SUPPLYING THE CITY of *DUBLIN* WITH WATER.

Castle (R.)
k

DUBLIN:
Printed by Syl. Pepyat, Printer to the Honourable
City of *Dublin*, MDCCXXXV.

ADVERTISEMENT.

That the following Eſſay was never intended for the Preſs, *will appear from the Incorrectneſs of the Stile, and the Method I have taken of explaining my Thoughts by plain, practical Principles, (collected from ſome Remarks I made in my Travels on the beſt Works of this Kind now ſubſiſting) rather than from Philoſophical, or meerly ſpeculative Notions in* Hydroſtatics; *believing it to be a leſs Offence to thoſe worthy Gentlemen who are moſtly concerned in the Matter, than had I amus'd them with Terms of Art. If therefore they will excuſe the Omiſsion, I ſhall readily ſubmit the* Facts *and* Calculations *here laid down wholly to their Candour and Scrutiny; and am their*

Moſt humble and

obedient Servant,

BRITISH MUSEUM

Rich^{D} Castle.

AN ESSAY, &c.

THE ſupplying the City with Water chiefly depends upon the *Quantity* that can be brought to the Reservoir; the neceſſary Conſumption; the Manner; in what Streets the *Main-Pipes* are laid; and what Bore will anſwer the Convenience of the Inhabitants.

It is therefore requiſite before an Enterprize of this Kind is enter'd upon, to have theſe Particulars clearly ſtated and aſcertained, for fear of meeting with a Diſappointment in the Practice, rather than a Benefit.

It is no leſs neceſſary, in the preſent Caſe, to endeavour to make the *Mains* already laid as uſeful as poſſible, by introducing as few Alterations in them as are conſiſtent with the well conducting of the whole, to prevent exceſſive Expence.

In the following Conſiderations, I ſhall endeavour to lay this important Undertaking in the cleareſt Light, and will be as conciſe as the Nature thereof will permit.

1ſt CONSIDERATION. *Quantity of Water.*

Without a ſufficient Quantity of Water, all Undertakings of this Kind are fruitleſs. Having therefore examin'd and gaug'd the Stream of Water which now runs into the CITY BASON, at the Place where it is divided, called the *Tongue*; I find it yields 11931 Hogſheads *per* Hour, the third Part of which, or the City's Share, is 3977 Hogſheads; and I have been informed by ſeveral of the Inhabitants near that Place, That in the drieſt Summer the Stream is ſeldom reduc'd duc'd to one half leſs than at the Time I gaug'd it; and if we allow 17 Hogſheads *per* Hour for the Difference of Velocity at ſuch times, it follows that 1980 Hogſheads *per* Hour, may be depended upon as a conſtant Supply during the dry Seaſon of the Year.

Having alſo examin'd and gaug'd the Water that runs through the Trough beyond *James*'s *Gate*, and the 10 Inch leaden *Main* out of the BASON, from which 3 Pipes of ſix Inches Diameter are taken, I find the former to yield 1085 Hogſheads, and the latter 470 Hogſheads, in all 1555 Hogſheads *per* Hour; and this is all the Water, as it is at preſent contrived, that can poſſibly be had to ſupply the City, without, however, allowing for Waſtes, which are now very conſiderable.

But before I particularize the Waſtes after the Water is brought near the BASON, I muſt beg leave to compare the Quantity of Water which now ſupplies the City, to the Stream at the *Tongue* where the Water divides, *viz.* 1980 Hogſheads *per*

Hour during the Summer Seaſon, to 1555 Hogſheads *per* Hour, the whole Quantity that can be let through the *Head Mains* as they are contrived at preſent; and it will evidently appear, that the Water, even in Summer, is either miſapply'd or waſted, otherwiſe there would be more than ſufficient for the City; for, notwithſtanding there are always great Waſtes in Water-Courſes, yet ſo large a Proportion as the Difference between the above Sums, *viz.* 425 Hogſheads *per* Hour, in ſo ſhort a Diſtance as from the *Tongue* to the Bason, cannot happen without great Abuſe and Miſmanagement: For ſuppoſing $\frac{1}{10}$ or 198 Hogſheads *per* Hour, to be the unavoidable Waſte, (which is a large Allowance) it follows, that 227 Hogſheads *per* Hour ſhould be brought to the Bason, *i. e.* more than can poſſibly be conveyed at preſent through the two *Head Mains*, whoſe Smallneſs muſt undoubtedly cauſe a Scarcity of Water in the City, tho' the Bason were full; and to aggravate this Evil, (in tracing the

Courſe from the BASON to the *Tongue*) I found the Channel for the moſt Part choak'd with Weeds and great Seepage thro' the Banks, occaſioned by their being irregularly diſpos'd, and not made in the proper Manner; but what moſt ſurpriz'd me, was, to find, in ſome Places above *Dolphin*'s Barn, Breaches made in the Banks, and only ſtop'd for the preſent with Sods, which ſerve inſtead of Sluices, in Summer, to let the Water run in ſmall Channels through the adjacent Fields, for private Uſes.

As to the Waſte which happens after the Water is conducted into the BASON, that is occaſion'd, 1*ſt*, By letting the Water run in an open Trough behind *James*'s *Gate*. 2*dly*, By conducting the Water in Shores along *Thomas*, *Francis-Street*, and *Bridge-foot-Street*.

Now one great Diſadvantage in ſuffering the City Water to run in an open Trough is this, that the neareſt Inhabitants to the Water-courſe will take the Liberty of ſerving themſelves, and will draw off what ſhou'd have been diſtributed proportionally, in ſuch Quantity and Manner as they think convenient; without regarding the Injury done to the Publick. And this Obſervation is confirm'd by the real Practiſe of ſeveral People who live near the City-Water, ſome of whom have a four Inch *Main*, others Cocks, leading from the Trough, which they open at Pleaſure, and draw off the greateſt Share of that Water which ſhou'd ſupply the whole City. Now this Damage is ſo conſiderable, that the 4 Inch *Pipe*, at a common Velocity, will deliver 75 Hogſheads *per* Hour, that is, near $\frac{1}{14}$ Part of the Quantity running through that Trough for the Supply of the whole City.

In making this Remark, I by no Means intend to deprive the Inhabitants of ſo much Water as their Occaſions may require, but only to prevent the too frequent Abuſe. 2*dly*, The conveying Water through Shores is never practis'd where there is a Scarcity; for Shores can by no Means be made ſo ſtaunch as to hold Water without a conſiderable Waſte. One quarter part is the common Allowance, which is a great Reduction of the City Supply.

A farther Inconvenience is, that as theſe Shores cannot be ſunk deep in the Ground, People are apt to tear up the Cover when Water is ſcarce, and ſupply themſelves.

It is likewiſe, if (I may be allow'd to ſay ſo,) a Miſmanagement to have one of the three ſix Inch *Mains* (which are ſupply'd from the BASON) apply'd only for the Uſe of *James*'s *Street*, under Pretence that it is choak'd up. Therefore, to ſet this, and the Manner in which the other Shores and *Mains* are carried in a clear Light, I have ſubjoined a Map of that Part of the City where they run, in which they are delineated, and to make the ſame yet more intelligible, diſtinguiſhed by different Colours.

To conclude this *Conſideration*, upon collecting together the ſeveral Abuſes to which the City Water is liable, it appears that 519 Hogſheads *per* Hour, are waſted in the following Manner.

The four Inch Pipe out of the Trough mention'd before, yields *per* Hour 75 Hogſheads.	75
And ſuppoſing the Cocks from the ſaid Trough to conſume twice that Quantity *per* Hour.	150
A ſix Inch *Main* in *James*'s *Street*, being $\frac{1}{3}$ of what comes from the Bason *per* Hour.	170
In the ſeveral Shores 990 Hogſheads *per* Hour, $\frac{1}{4}$ of which runs waſte. - - - -	242
Total Waſte	637 Hh^{ds}.

Out of which muſt be deducted a Supply for *James*'s and *Thomas*'s *Street*, and allowing for that Purpoſe a five Inch *Main*, on Account of the many Brewers and Malt-houſes, 118 Hogſheads will be the hourly Supply, (which far exceeds what is neceſſary) and then the whole Waſte will be reduced to 519 Hogſheads *per* Hour.

The above 519 Hogſheads is near $\frac{1}{3}$ of the whole Fund of Water when brought to the City; and if to this be added the Waſte in the Channel as mention'd before, and the Incidents occaſion'd by the irregular Diſpoſition of the preſent *Pipes*, as ſhall be hinted hereafter, no Wonder that the great Scarcity in Summer occaſions a general Complaint.

This is ſtrictly the *State* of the City Water, which, if well manag'd, I make no Doubt wou'd be more than ſufficient to ſupply not only all the *Pipes* now laid, but alſo the whole *Liberty*, as I ſhall ſhew in the *Second Conſideration.*

2d CONSIDERATION. *Proving the Fund of Water ſufficient to ſupply the City.*

The Fund of the City Water being determined, I ſhall now endeavour how to apply the ſaid Fund under the three following Heads.

1*ſt*, By conſidering the Waſte which Works of this Nature are ſubject to; as alſo by proving that a five Inch *Main* is a ſufficient Supply for the Inhabitants of *James*'s and *Thomas*' *Street*.

2*dly*, In what *Streets* the *Pipes* are already laid, and what *Quantity* of Water they will require.

3*dly*, What Proportion the *Streets* where the *Pipes* are now laid bear to thoſe that are as yet unprovided for, and in what *Streets*, and how far, one may venture to lay new *Pipes* upon the preſent Fund of Water.

All Undertakings of this Kind are ſubject to two Waſtes.

1*ſt*, The *Firſt* will be more or leſs according to the Diſtance and Situation of the Ground through which the Channel muſt be made, to convey the Water to the RESERVOIR.

2*d*, The *Second* may be conſiderably reduc'd by diſtributing the Water properly, and this depends chiefly on the good Contrivance and Execution of the Work.

In the preſent Caſe, the Diſtance from the *Tongue* is ſhort, and the Bason lies on an Height ſufficient to force the Water to any Part of the Town; conſequently, if well manag'd, the Waſte will be very ſmall, and reduc'd to the two following Particulars, *viz.*

$\frac{1}{10}$ for the Waſte in the Channel from the *Tongue* to the Bason *per* Hour.	198
$\frac{1}{8}$ for the Exhalation of the Sun, Seepage in the Banks of the Bason, loſt in the Pipes, &c.	247
Total Waſte	445 Hh$^{ds.}$

The above Sum of 445 Hogſheads *per* Hour (which is a conſiderable Allowance) being deducted from 1980 Hogſheads *per* Hour, the Summer ſupply at the *Tongue*, the Remainder, 1535 Hogſheads *per* Hour is neat meaſure.

The next is to prove the Allowance of a *Pipe* five Inches Diameter ſufficient to ſupply *James*'s and *Thomas*'s *Street*.

Both Sides of theſe *Streets* contain 385 Perch, Plantation Meaſure; and if 20 Feet in Front on an Average be allowed to each Houſe, then there will be 404 Houſes, of which 30 are ſuppos'd to be Brewers Offices.

In the preceeding *Conſideration* a Pipe of 5 Inch Diameter was allow'd for the Supply of theſe Streets, which by Computation yielded 118 Hogſheads *per* Hour; and if that Quantity be multiply'd by 24, then 2832 Hogſheads will be the daily Supply; and ſuppoſing every Brewery to conſume 50 Hogſheads, every publick Houſe 6 Hogſheads, and every private Houſe 2 Hogſheads, then the Diviſion will ſtand thus,

30	Brewers Offices, at 50 Hogſheads *per* Day, -	1500
143	Publick Houſes at 6 Hogſheads - - -	858
231	Private Houſes at 2 Hogſheads - - - -	462
	Incidents - - - - -	12
404	Houſes *per Diem*	2832 Hh$^{ds.}$

In the above Diviſion there being but 20 Feet Front allowed to each Houſe; and as Breweries and publick Houſes by far exceed that Dimenſion, it follows that the Number of Houſes will be thereby reduc'd, and the Quantity of Water to every Houſe increaſed, in Proportion to the Number of Feet in Front; and how this Diviſion of Water may be made from the ſame Main by Branches of different Bores, is ſo well known, that a farther Explanation would be needleſs.

2dly, In the foregoing *Head*, the neat Meaſure of Water was reduc'd to 1535 Hogſheads *per* Hour, out of which deducting 118 Hogſheads *per* Hour for the Supply of *James*'s and *Thomas*' *Street*, the Remainder is 1417 Hogſheads *per* Hour, which being multiply'd by 24, the Product will be 34008 Hogſheads as a conſtant Fund of Water *per* Day.

For the better determining the Quantity of Water neceſſary to ſupply the *Streets* in which the *Pipes* are already laid; I have here inſerted an alphabetical

Catalogue, with their particular Dimenſions, meaſuring both Sides of each *Street*, *viz.*

CATALOGUE *of the* Streets *in which* Pipes *are already laid.*

	Perch
ASH Street	70
Arran Street	55
Abby Street, part	216
Arran Quay	40
Angleſy Street	40
	421
Back Lane	70
Bridge Street	52
Britton Street, Gr. part of	190
Batchellors Walk	87
Bridge-foot Street	52
Blind Quay	79
Boot Lane	54
Bull Alley	50
Bride Street	64
Bow Street, *alias* Lough-Boy	100
	798
Corn Market, Old	48
Cork-hill	17
Caſtle Street	50
Chriſt Church Lane	68
Capel Street	240
Combe, Lower	44
Church Street, part of	90
Ditto——, remainder of	90
Carry'd Over	647
Brought Over	647
Cooke Street	92
Coal Quay	49
Crane Lane	24
Charles Street	40
Cow Lane	54
Coals Lane	88
Colledge Green, South and North	44
Colledge Street	42
Colraine Street	64
	1144
Derby Square	18
Dames Street	106
	124
Euſtace Street	40
Eſſex Street	54
	94
Francis Street	187
Fiſh-ſhamble Street	54
Fleet Street	112
Fiſhers Lane	54
	407
Totals Carry'd Over	2988

Golden

	Perch
Brought Over	2988
Golden Lane	72
High Street	64
Hoey's Alley	36
Hay Market	30
Hawkins Street	54
Henry Street	156
Hog-hill	43
	383
Jarvaſs Street	132
Inns Quay	53
	185
Kenedy and Roſs Lane	50
King Street	245
	295
Liffee Street, part	24
Lazers-hill	124
Longford Street, part	32
Linnen-hall Street	48
	228
Michael's Lane	80
Mary Street	110
Mary's Lane	152
Merchants Quay	75
Mary's Abby	46
Montrath Street	32
	495
Nicholas Street	48
New-row	34
	82
Carry'd Over	4728

	Perch
Totals Brought Over	4728
Ormond Quay to Eſſex-Bridge	53
Phroper Lane	90
Plunket Street	78
Patrick Street	42
Pembroke Court	28
Pill Lane	134
Patrick's-well Lane, part	31
	403
Queen Street	130
Skinner-row	50
School-houſe Lane	70
Strand Street	108
Smith-field	96
Stafford Street	126
Stephen Street	86
Suffolk Street	35
Sycamore Alley	28
Smock Alley	37
Ship Street, big	66
Stony-batter	26
	728
Temple Bar	94
Trinity Lane	20
	114
Vicar Street	52
Uſhers Quay, the lower	56
Ditto——the upper	45
	153
Warburgh Street	56
Wine-Tavern Street	52
William Street	90
	198
Total	6507

Memorandum. *James' Street* and *Thomas' Street*, being ſupply'd ſeparate from the other *Streets*, are not included in this *Catalogue.*

The total Sum in the above *Catalogue* is 6507 *Perch*, Plantation Meaſure; and if 20 Feet in Front be allowed upon an Average to each Houſe, the Number of Houſes will be 6832, and allowing $\frac{1}{4}$ Part for Courts and ſmall Lanes, then the total Number of Houſes in that Part of the Town where the Pipes are now laid, will amount to 8540, which I will ſuppoſe to require two Hogſheads *per* Day. —— It then follows, that 17080 Hogſheads *per* Day will be a ſufficient Supply for all the *Streets* mentioned in the *Catalogue*, as well as the ſeveral private Courts and Lanes adjacent thereto.

And here again, it muſt be remember'd, that every Houſe containing more than 20 Feet in Front, occaſions an Increaſe of Water in Proportion to the

Number of Feet. The above 17080 Hogſheads being compared with the whole Fund of Water *per* Day, *viz.* 34008 Hogſheads, it evidently appears, that the *Streets* mention'd in the *Catalogue* may be plentifully ſupply'd with Water, and there will then remain a Surplus or Difference of 16928 Hogſheads *per* Day towards furniſhing the remaining Part of the *City Liberty*, as alſo any additional Quantities that may be neceſſary for publick Offices, as ſhall be mentioned hereafter.

3*dly*, The Proportion the *Streets* as yet unprovided with Water bear to thoſe wherein the *Pipes* are already laid, will be beſt diſcovered by comparing the following *Catalogue* with that mention'd before.

CATALOGUE *of the* Streets *unprovided with* Water.

	Perch
Angier Street, part	88
Anne Street, near the Green	52
Aſton's Quay	59
Abby Street, part	32
Arron Street, Weſt	46
Ann Street, near the Linnen-Hall	46
	323
Bridget Street, part	96
Butter Lane, Great	80
Barrack Street	46
Bolton Street	120
Britton Street, Great, part	38
Bridewell Street	32
	412
Church Lane (Peter)	15
Chequer Lane	116
Cuff Street	96
Channel Row	176
Chancery Lane	86
Clarendon Street and Market	96
	585
Dawſon Street	140
Duke Street	42
Drogheda Street	70
Carry'd over	252
Brought over	252
George's Lane	120
Grafton Street	140
George's Hill	40
	300
Hammond Lane	36
Henrietta Street	60
	96
King Street, near the Green	58
Ditto, near Linnen Hall	56
	114
Longford Street, part	44
Liffee Street	132
Lough-boy	32
	208
Marlborough Street, part	80
New Church Street	24
Ormond Quay, part	59
	163
Totals carried over	2453

	Perch		Perch
Brought over.	2453	Brought over	320
Peter Street ——	44	Tyghe Street ——	56
Phenix Street ——	36		
Pudding Lane ——	24	White-Fryar Street —	81
Princes Street ——	72	Wood Street ——	54
		White Fryar Lane	42
	176		
			177
Stephen's Green ——	274		
Swift's Row ——	46	York Street ——	100
Carry'd over	320		3282

The above 3282 *Perch* being reduc'd as before, the Number of Houſes will be 3446, which, in Proportion to the former Calculation, will require 6892 Hogſheads *per* Day; and this Sum being deducted from the laſt Surplus of 16928 Hogſheads *per* Day, there will ſtill remain 10,036 Hogſheads *per* Day.

But in this, as well as in the former Calculation, there being no Allowance made for Brewers, Diſtillers, Sugar-Bakers, *&c.* which require conſiderably larger Quantities of Water than according to the Allowance before made *per* Houſe; and of theſe ſuppoſing 120 in Number at 40 Hogſheads *per* Day extraordinary, which will amount to 4800. This Sum being again deducted from the laſt Surpluſs, *viz.* 10036, there will yet be a Remainder of 5236 Hogſheads *per* Day, which may ſerve for Incidents and unforeſeen Occaſions, it being certain, that in all Undertakings of this Kind, under whatever Regulation they are carried on, great Quantities of Water will be expended and conſumed by Careleſsneſs and Negligence; but as the above 5236 Hogſheads *per* Day, together with the neceſſary Waſte before mention'd, is a large Allowance, I dare venture to affirm the preſent Fund of Water ſufficient to ſupply the whole *City Liberty*, and therefore it ſeems to me an extravagant Project to raiſe Water from the *Liffee* by a Machine, when it otherwiſe may be obtain'd with ſo much Eaſe, and at ſo moderate an Expence: For a Machine will not only be very chargeable in the immediate Execution, but muſt always continue to be ſo, from a conſtant Attendance and neceſſary Repairs.

The principal Points relating to this Undertaking having been adjuſted, there now remains nothing more than to eſtabliſh, in the *laſt* Place, a Method for conducting and properly diſtributing the Water.

The 3*d* CONSIDERATION. *Of conducting and diſtributing the Water.*

As there is no Undertaking ſo entirely new as to bear no relation to ſome other Work now in Being, it is requiſite to examine what Methods have been taken with thoſe that have ſuceeded beſt, what Reſemblance they bear to the Caſe in Hand, and what Improvements may be made upon them. Without particularizing all the ſeveral Works Abroad of this Kind, I ſhall only mention thoſe that were exiſting at the Time I left *London*, *viz.*

1. The Machine at *London* Bridge.
2. New River Water.
3. *York*-Buildings.
4. *Chelſea* Water-Works.

Each of theſe contributes towards ſupplying the City of *London* with Water in a different Way. The *firſt* operates by Means of the Tide, and formerly threw up the Water into a large Ciſtern upon ſaid Bridge, but now forces it into ſeveral ſmall Ciſterns made for this Purpoſe on the higheſt Parts of the City, and from thence conveys it by *Pipes* to the ſeveral Streets. The *ſecond* is a Channel of 10 Feet wide and 15 Miles in Length, through which the Water is conveyed to *London*. The *third* rais'd the Water by a *Fire-Engine* from the *Thames* and conveys it into a *Reſervoir* near *Mary-bone Fields*. The *fourth* is by a Canal thro' *Tothill-Fields*, about 2 Miles in Length, into which the Tide flows, and by Means of a Sluice affords a Current ſufficient to work this Machine, which throws the Water into a *Baſon* upon *Conſtitution Hill*, and another in *Hyde-Park*.

Of theſe ſeveral Methods the new River is eſteem'd the beſt for a Supply of Water; for, notwithſtanding the great Expence of conducting it for the Space of 15 Miles, in which Courſe a long Valley interpoſing, has made an *Aqueduct* of a conſiderable Height acroſs the ſame neceſſary; yet the Proprietors have near quadrupled their original Stock; and probably, had this River been capable of ſupplying the whole City, the Machine at *London* Bridge wou'd have met with the ſame Fate as that of *York-Buildings*, which is now laid aſide, (after having been made uſe of about four Years) on Account of the exceſſive Expence that attended it, altho' ſupported by a rich and publick Company: Nor would the *Chelſea* Water-Work (tho' the beſt contrived Machine of its Kind) have been thought worth purſuing, if the Water from the New River had been ſufficient.——From whence it is plain, that a Supply of Water, when it can be had without any Engine, is, (beſides other Advantages) the leaſt expenſive.

The City of *Dublin*, in reſpect to Water, has all the Conveniences which flow to the City of *London* from the New River, without the Diſadvantages which this latter is ſubject to; for it neither requires an AQUEDUCT, nor is the Water to be conducted from a great Diſtance, and yet there is a ſufficient Quantity, as has been already ſhewn. However, the Caſe of the *Dublin* Water-courſe, and the New River being nearly equal, the beſt Method, as I apprehend, is to follow a Model which has been crown'd with ſuch Succeſs, and therefore I ſhall deſcribe that a little further.

The New River is conveyed into a RESERVOIR or BASON near *Iſlington*, and from thence by *Mains* into ſeveral ſmall Ciſterns (to give the Water vent which otherwiſe wou'd burſt the *Pipes*, and likewiſe for the more equal diſtributing of the ſame) built upon the higheſt Parts of the City, from whence it is conveyed again by ſmaller *Pipes* through the ſeveral *Streets*, and theſe ſmaller *Pipes* are carried through the very *Streets* where the *Mains* are laid, it never being ſuffer'd to branch directly from the chief *Mains*, for this Reaſon, becauſe the Water can never be forced up an Hill, while the ſmall *Pipes* fixed to theſe *Mains* are running. Thro' a Neglect of which Regulation it comes to paſs in *Dublin*, that when the Cocks are running in the Houſes about *Newgate*,

gate, *Michael*'s, and *School-houſe Lane*, not one Drop of Water is to be had in *Skinner-Row*, *Caſtle-Street*, *&c.* nor can it be expected that the Water ſhould be forced up *Capel-Street* to ſupply the more diſtant Branches, ſo long as there are Vents given to it upon the *Quays.*——— Many other Irregularities in the Oeconomy of the preſent *Mains* I omit for Brevity's Sake.

The Method practis'd in *London* of obliging every Houſe that takes the Water in to have a Ciſtern, or a Cask with a Ball-Cock in it, is of ſingular Advantage. For the Difference between theſe and the common Cocks is, that when the Ciſtern or Cask is full, the Water raiſes the Ball and ſhuts the Cock, and when any Water is drawn out of the Ciſtern, then the Cock opens, (for the Ball ſinks) and the ſame Proportion of Water as was taken out, runs again into the Ciſtern.

The Manner in which *London* is ſupply'd from the New River, and the near Reſemblance the Method of ſupplying *Dublin* has thereto, being well conſider'd, there will be no Difficulty in copying after that excellent Pattern.

The *firſt* Thing to be done, in my Opinion, is to open and clear the Channel which conveys the Water to the BASON, diſpoſing the whole Courſe in ſuch a proper and regular Manner, as may prevent the preſent Abuſes.

Secondly, To cleanſe and ſtaunch the BASON, bringing the whole Fund of Water into it, in the ſame Manner as the New River is conducted into the RESERVOIR near *Islington*, and from thence to diſtribute the Water in like Manner to the ſeveral *Mains* which are to convey it into the Ciſterns built upon the higheſt Parts of the City, only with this Improvement, that inſtead of bringing the 6 ſeven Inch *Mains*, neceſſary to ſupply the City of DUBLIN with Water, directly from the BASON, I would introduce an artificial *Main* made of Elm or Beech Plank, 4 Inches thick, of an *Octogan* Shape, and about 16 Inches Diameter, by which Means the Angles will become very ſolid and ſtrong, and the better able to receive the Trunels with which the Sides are to be joined together. To make the Joints (Length-ways) ſtaunch and tight, I propoſe to caulke them with turn'd Lead Shavings: And for the better explaining of this *Main*, and the Manner in which it is to be joined at every Length, have made a ſmall Model which repreſents it in all its Parts. The Reaſon I prefer this *Main* to thoſe commonly made uſe of is, becauſe the Cavity thereof will be larger, and by far exceed the Bore of any *Pipe* that can be made, the Friction will be conſiderably leſs, the Velocity much quicker, and of Conſequence the Quantity of Water increaſed, even to the whole Fund neceſſary for the Supply of the City of DUBLIN; beſides this further Advantage, that 565 *l.* 19 *s.* will be ſaved to this Undertaking by Means thereof, as will appear by the Eſtimate.——— This *Main* I wou'd have continu'd from the BASON to ſomewhat below *James*'s *Gate*, and at the End thereof a leaden Box fixed, of 6 Feet in Length, and 16 Inches Square. In this Box there muſt be 6 Sockets, of 7 Inches Diameter each, to force the Water into 6 *Mains* of the ſame Bore, which are to convey it into ſmall Ciſterns of 5 Feet Square, placed upon the higheſt Parts of thoſe *Streets* to which each particular *Main* is appropriated. There alſo muſt be a Cock fixed at the Beginning to each of theſe *Mains*, in order to turn off or divert the Water another Way, upon Occaſion, as is practis'd in all the Works of this Kind in *London*. From the Ciſterns the Water muſt be let into the ſeveral ſmall *Pipes* which are led through the *Streets*. The Water by this Method being firſt brought to the higheſt Part of each *Main* it is to ſupply before any can be taken off, will be divided to a moſt exact Equality only by placing the ſeveral ſmaller *Pipes* at different Heights in thoſe Ciſterns, according to the different Levels of each Street, and of Courſe furniſh every Houſe with its allotted Quantity and Proportion, which otherwiſe wou'd be impracticable. For the better explaining the ſeveral Situations of each *Ciſtern*, *Main* and *Branch*, and the Method uſed in conducting this *Scheme*, I have ſubjoined the following Papers.

I. *A* Map *of the City and Suburbs of* Dublin *within the* Lord Mayor'*s* Liberty, *wherein the* Mains *and* Branches *already laid are delineated (and for the better diſtinguiſhing the ſame) in different Colours*, viz. Yellow, Blew, Green, *and* Orange *Colour. The* Red *Lines denote the two* Mains *to be added, as likewiſe ſome* Branches *to be joined to the former* Mains, *by which it will appear, that notwithſtanding the great Irregularity in the Diſpoſition of the preſent* Pipes, *I propoſe to alter none but* James'*s and* Capel *Street.*

II. *An* Inventary *of the* Streets *where the* Pipes *are already laid, of what* Bore, *and from what* Main *each* Street *is ſupply'd, their reſpective Dimenſions, and the total* Perches *each* Main *ſupplies.*

III. *An* Inventary *of all the* Streets *in the* City Liberty, *and how they are applied to the ſix principal* Mains, *with their reſpective Dimenſions, and the Number of* Perches *each* Main *will ſupply.*

IV. *An* Eſtimate *of the* Charge *of compleating this* Important Undertaking.

An Eſtimate *of the reſpective Charges for* ſupplying *the City of* DUBLIN *with WATER.*

	l.	*s.*
FOR clearing the Channel, and diſpoſing the Courſe in a regular Manner.	200	00
For clearing and ſtaunching the BASON, and making a proper Sluice to cleanſe it any time for the future.	350	00
147 *Perch* of large *Octogone-Main* at 5 *l.* 3 *s.* *per* Perch,	757	01
The great Leaden-Box and Sockets,	040	00
12 large Braſs Cocks,	100	00
25 leſſer Cocks,	100	00
767 *Perch* of 7 Inch *Main*, at 1 *l.* 10 *s.*	1150	10
1641 *Perch* of a 4 Inch *Pipe*, at 20 *s.*	1641	00
3 Ciſterns 5 Foot Square of Lead,	[illegible]	00
	[illegible]18	11

N. B. If in the above *Eſtimate* the Article 147 *Perch* of *Octogone-Main* ſhould be changed, and 6 common *Mains* of 7 Inch Bore introduced for the ſame Length, the Charge would be augmented to 1323 *l.* ſo that upon comparing this Method with the *Octogone Pipe*, the Sum of 565 *l.* 19 *s.* is evidently ſaved by the latter Contrivance. Moreover, as the ſeveral Articles of this [illegible] depend upon the Number of Perches to which th[illegible] to be continued, it follows, that if any of [illegible] *Streets*, by their not being compleatly built, or inh[illegible] poor People, ſhall be thought not worth while to h[illegible]s laid in them, the above Charge will be reduc'd in Proportion to the Number of Perches cut off, which Reduction will be farther diminiſh'd if the Materials may be had cheaper than I compute them. However, in this *Eſtimate*, I choſe to repreſent things in their full Extent, leaving it to the Gentlemen appointed to inſpect this Matter, to retrench what they think ſuperfluous, as they may readily do by looking over the Liſt of Streets to be provided, and may as eaſily hereafter enlarge the Supply to any Street by the Method already laid down.

FINIS.